CLAIMS

What is claimed is:

1. A touch screen system, comprising:

a substrate that has a surface;

a plurality of acoustic wave transducers located near a perimeter of the substrate surface; and

a control component that determines a location of a perturbation on the substrate surface.

2. The system of claim 1, the plurality of acoustic wave transducers comprises at least one acoustic wave transducer that transmits a first acoustic wave that propagates along the substrate surface, and at least two acoustic wave transducers that receive acoustic waves that propagate along the substrate surface.

3. The system of claim 2, the location of the perturbation on the substrate surface is determined based, at least in part, on time delays between transmission of the first acoustic wave from the first transducer and receipt of a corresponding acoustic wave at each of the second and third transducers that was reflected or scattered from the location of the substrate surface being perturbed.

4. The system of claim 3, the time delays between transmission of the first acoustic wave and receipt of corresponding perturbation-reflected acoustic waves at the second and third transducers define respective ellipses.

5. The system of claim 4, an intersection between the ellipses delineates a perturbation location on the surface of the substrate.

6. The system of claim 1, the surface of the substrate is at least one of soda-lime glass, borosilicate glass, a crown glass, a barium-containing glass, a strontium-

containing glass, a boron-containing glass, a glass laminate capable of supporting acoustic wave propagation, a ceramic material, aluminum, an aluminum alloy, a coated aluminum substrate capable of supporting acoustic wave propagation, and a low-acoustic-loss polymer.

7. The system of claim 1, each transducer comprises at least one piezoelectric element.

8. The system of claim 7, the plurality of transducers comprises a transmitting transducer that converts an electrical signal into an acoustic wave that is propagated across the substrate surface.

9. The system of claim 7, the plurality of transducers comprises at least two receiving transducers that convert an acoustic wave that is propagated across the substrate surface into an electrical signal that can be analyzed by the control component.

10. The system of claim 9, further comprising a comprising at least one grating associated with each of the at least two receiving transducers and disposed above the piezoelectric element of each receiving transducer.

11. The system of claim 9, further comprising an amplifier associated with each receiving transducer that amplifies the electrical signal produced by the receiving component for analysis by the control component.

12. A method for determining a location of a perturbation on a substrate surface, comprising:

transmitting an acoustic wave across a substrate surface;

detecting the transmitted acoustic wave at at least two points near a perimeter of the substrate surface;

detecting extant time delays between transmission of the acoustic wave and receipt of the acoustic wave at the at least two points; and

determining a location of perturbation of the substrate surface based at least in part on detected time delays.

13. The method of claim 12, further comprising transmitting the acoustic wave at a broad diffraction angle to propagate the wave across the entire substrate surface.

14. The method of claim 13, further comprising perturbing the substrate surface to deflect the transmitted acoustic wave.

15. The method of claim 12, further comprising converting the detected acoustic waves into electrical signals.

16. The method of claim 15, further comprising transmitting the electrical signals to a control component for analysis.

17. The method of claim 16, further comprising amplifying the electrical signal during transmission to the control component.

18. The method of claim 16, further comprising analyzing the electrical signals to determine the time delay between transmission of the acoustic wave and receipt of the transmitted acoustic wave at each receiving transducer.

19. The method of claim 18, further comprising employing gratings in close proximity to each of at least two receiving transducers to direct an incoming acoustic wave longitudinally to each respective receiving transducer.

20. A system for determining a perturbation location on a substrate surface, comprising,

means for transmitting an acoustic wave across a substrate surface;

means for receiving the transmitted acoustic wave at at least two points near a perimeter of the substrate surface; and

means for determining a location of a perturbation of the substrate surface based at least in part on time delays between transmission and receipt of the acoustic wave.

21. The system of claim 20, further comprising means for longitudinally directing a transmitted acoustic wave to the means for receiving the transmitted acoustic wave.

22. The system of claim 20, further comprising means for converting an electrical signal into a mechanical signal that stresses the substrate surface.

23. The system of claim 20, further comprising means for converting a mechanical stress signal to an electrical signal indicative of the mechanical stress signal.